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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
CORDRAY, DENNIS R	
ART UNIT	**PAPER NUMBER**
1731	

DATE MAILED: 05/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/521,568	SATO, HARUYUKI	
	Examiner	Art Unit	
	Dennis Cordray	1731	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-14 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-14 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 4/18/2005.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

The disclosure is objected to because of the following informalities: On p 1, line 2 under the heading "Background of the invention" the word "in" should be inserted between "used" and "paper."

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites "...a constituent unit derived from at least one nonionic monomer having a solubility parameter of 20.5 $(MPa)^{1/2}$ or less and a constituent unit derived from at least one anionic or cationic monomer and a surfactant (B)..." It is not clear whether a) the latter constituent unit is derived from at least one anionic or cationic monomer and a surfactant or b) the latter constituent unit is derived from at least one anionic or cationic monomer, and the surfactant is not part of the derived monomer.

Claim 5 recites the limitation "the nonionic unsaturated monomer having a solubility parameter of 26.6 $(MPa)^{1/2}$ or more" in Claim 1. There is insufficient antecedent basis for this limitation in the claim.

The remaining claims depend from Claim 1 thus inherit the indefiniteness of the parent claim.

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Honig et al (5167766).

Honig et al discloses a drainage and retention system used in papermaking comprising crosslinked organic microbeads, a high molecular weight polymer and/or polysaccharide, or starch (Abstract). The microbeads are formed from nonionic and anionic and/or cationic monomers (col 5, lines 14-23; col 6, lines 3-5). Anionic monomers include (meth)acrylic acid and salts thereof, 2-acrylamido-2-methylpropane sulfonate, vinylsulfonic acid, styrenesulfonic acid, maleic or other dibasic acids and their salts, and mixtures thereof (col 5, line 64 to col 6, line 2), which are examples of suitable anionic monomers recited in the instant Specification on p 15. Nonionic monomers include one or more of acrylamide (the monomer having a solubility parameter greater than 26.6), N-alkyl acrylamides and methyl (meth)acrylate (col 6, lines 3-11), which are unsaturated monomers recited as examples on p 14 of the instant Specification. Cationic monomers include dialkylaminoalkyl (meth)acrylates and salts or quaternaries thereof, N,N-dialkylaminoalkyl (meth)acrylamides and salts or quaternaries thereof (col 5, lines 25-63), which are examples recited on p 15 of the instant Specification. The nonionic monomers can be present up to 99% by weight of the copolymer and cationic

or anionic monomers can be present from 1 to 100 parts by weight, with preferred ranges of from 10 to 90% by weight of each (col 6, lines 16-25). Polyfunctional crosslinking agents, which include N,N-methylenebis(meth)acrylamide, polyethyleneglycol diacrylate, divinylbenzene (recited on p 16 of the instant Specification) are also present during the polymerization in an amount of from 4 to 6000 molar ppm (col 6, lines 36-47 and 55-62).

Honig et al discloses the use of a surfactant having an HLB value from 8 to about 11 (col 7, lines 59-61). Alternatively, isopropanol can be added to the polymer emulsion to aid in precipitation of the polymer (col 11, lines 47-50). Alcohols are recited in the instant Specification on p 22 as suitable surfactants. Several examples are given for preparing the polymers wherein the ratio of surfactant to total monomers by weight is 5/100 (col 12, lines 31-48), 33/100 (col 11, lines 20-37) and 86/100 (col 12, lines 1-16). Examples of polymer solutions are given having a surfactant level of 2, 4 or 8% by weight of the emulsion (col 10, line 66 to col 11, line 18). The weight percent of surfactant with respect to the to polymer in the solutions is thus greater than 2, 4 or 8% (weight ratio of surfactant to polymer is greater 2/100, 4/100 or 8/100). The disclosed surfactant/polymer ratios significantly overlap and thus anticipate the claimed range. Honig et al discloses a surfactant used to disperse the microbeads into water that can be an ethoxylated alcohol, which is water soluble (col 11, lines 54-60).

Honig et al discloses that the drainage and retention system also comprises a starch and/or a high molecular weight ionic polymer (col 2, lines 40-46). The high molecular weight polymer can have a molecular weight from 100,000 to 25,000,000,

which significantly overlaps the claimed range (col 8, lines 23-31). The ionic polymers can comprise homopolymers or copolymers having any of the ionic monomers used for the microbeads, with acrylamide copolymers being preferred, thus the range of polymer compositions includes water soluble polymers.

Honig et al discloses paper (pulp sheet) made by the process (col 9, lines 7-8), wherein the microbeads, surfactant, and high molecular weight polymer and/or starch are added to the pulp before the headbox (col 9, lines 14-18).

The copolymers disclosed by Honig et al, when added to the suspension, are capable of functioning as paper quality improving agents to provide the claimed improvement in bulky value, opacity, brightness or ratio in burst index because, where the claimed and prior art apparatus or product are identical or substantially identical in structure or composition, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). In other words, when the structure recited in the reference is substantially identical to that of the claims, the claimed properties or functions are presumed to be inherent.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Honig et al in view of Haylock (Paper, Its making merchanting and usage, 3rd ed, The national Association of Paper Merchants, London, 1974, p 72).

Honig et al does not disclose the speed of the papermaking machine. Haylock gives a general overview of modern papermaking processes and teaches that it is known to make paper on a fast machine at speeds of over 300 m/min (p 72, 3rd full par from top). The art of Honig et al, Haylock and the instant invention are analogous in that they pertain to making paper on high speed machines. It would have been obvious to one of ordinary skill in the art to use the claimed speed to make the paper of Honig et al in view of Haylock as a typical speed range of a fast papermaking machine.

Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Honig (5431783) in view of Honig et al and further in view of Haylock.

Honig discloses a drainage and retention system used in papermaking comprising crosslinked organic polymeric microbeads, a polyethyleneimine and/or polysaccharide (Abstract; col 1, lines 13-19). The microbeads are polymerized using anionic, cationic and nonionic monomers in the presence of a crosslinking agent (col 6, line 68 to col 7, line 4). The nonionic monomers can be present up to 99% by weight of the copolymer and cationic or anionic monomers can be present from 1 to 100 parts by weight, with preferred ranges of from 10 to 90% by weight of each (col 7, lines 27-35). Anionic monomers include salts of (meth)acrylic acid, 2-acrylamide-2-methylpropane sulfonete, vinylsulfonic acid, styrenesulfonic acid. Maleic and other dibasic acids (col 7,

lines 7-13). Nonionic monomers include (meth)acrylamide, N-alkylacrylamides and methyl (meth)acrylate (col 7, lines 14-22). Cationic monomers include dialkylaminoalkyl (meth)acrylates and salts or quaternaries thereof, N,N-dialkylaminoalkyl (meth)acrylamides and salts or quaternaries thereof (col 7, line 67 to col 8, line 10). Crosslinking agents include N,N-methylenebis (meth)acrylamide, polyethyleneglycol di(meth)acrylate and divinylbenzene (col 7, lines 51-58). The disclosed monomers are recited in the instant Specification on pp 14-16). Honig discloses use of a cationic, anionic or nonionic surfactant with an HLB from about 8 to about 11 (col 9, lines 42-44). The polymers are added to the furnish (col 13, Claim 1).

Honig does not disclose the ratio of surfactant/polymer. Honig further does not disclose a paper sheet or the speed of the papermaking process. Honig does not disclose the molecular weight of the polyethyleneimine or starch. Honig also does not disclose that a surfactant used to disperse the microbeads in water can be an ethoxylated alcohol.

As discussed above in the rejection under 35 U.S.C. 102(b), Honig et al discloses the molecular weight of the polymer used in addition to the microbead. Honig et al also discloses a surfactant to disperse the microbeads in water that can be an ethoxylated alcohol. Honig et al provides several examples of monomer compositions having a surfactant/polymer ratio in the claimed range. Honig et al discloses a paper made using the drainage and retention system. Honig et al does not disclose the speed of the papermaking process. However, Haylock gives a general overview of modern

papermaking processes and teaches that it is known to make paper on a fast machine at speeds of over 300 m/min.

The art of Honig, Honig et al, Haylock and the instant invention are analogous as pertaining to papermaking using additives. It would have been obvious to one of ordinary skill in the art to use an ethoxylated alcohol surfactant and to obtain the claimed surfactant/polymer ratio in the process of Honig in view of Honig et al and further in view of Haylock as a functionally equivalent option. It would also have been obvious to use a polyethyleneimine or starch with the claimed molecular weight as part of a known drainage and retention system and a functionally equivalent option. Making a paper sheet at the claimed speed using a high speed papermaking process is obvious. Obtaining the claimed improvement in properties of a paper would be obvious since the composition used to make the paper is the same as the claimed composition.

Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ryles et al (5171808) in view of Honig et al and further in view of Haylock.

Ryles et al discloses a microparticle system used to flocculate dispersions of suspended solids in papermaking processes (Abstract). The microparticles are crosslinked anionic or amphoteric polymers. Suitable anionic monomers include (meth)acrylic acid, 2-acrylamido-2-alkylsulfonic acid and sodium salts of the acids. Cationic monomers include vinyl monomers having a quaternary ammonium salt. Nonionic monomers include (meth)acrylamide and N-alkylacrylamide (col 2, lines 3-39). The copolymers can have 0-95 parts by weight of nonionic monomer and 5-100 parts by

weight of anionic monomer (for anionic copolymer) or 0-75 parts by weight of nonionic monomer and 1-99 parts by weight each of an anionic and a cationic monomer (for amphoteric copolymer) (col 4,lines 31-44). Crosslinking agents include N,N-methylenebisacrylamide, polyethyleneglycol dimethacrylate, vinylbenzene and triallylammonium salts (col 4,lines 47-55). The monomer composition also comprises a surfactant with an HLB value from about 8 to about 11 (col 6, lines 7-9). Isopropanol can also be added to precipitate the polymer (col 7, lines 10-12). A surfactant used to disperse the microbeads in water is an ethoxylated alcohol (col 7, lines 18-21). Alcohols are recited in the instant Specification on p 22 as suitable surfactants. Examples are provided wherein a high molecular weight cationic polymer (molecular weight of 5,000,000 to 10,000,000) is used with the microbeads (col 7, line 65 to col 8, line 4). The microparticle system is added to the papermaking stock prior to draining (col 7, lines 51-55).

Ryles et al does not disclose the ratio of surfactant/polymer. Ryles et al further does not disclose a paper sheet or the speed of the papermaking process.

As discussed above in the rejection under 35 U.S.C. 102(b), Honig et al provides several examples of compositions having a surfactant/polymer ratio in the claimed range. Honig et al also discloses a paper made using the drainage and retention system. Honig et al does not disclose the speed of the papermaking process. However, Haylock gives a general overview of modern papermaking processes and teaches that it is known to make paper on a fast machine at speeds of over 300 m/min.

The art of Ryles et al, Honig et al, Haylock and the instant invention are analogous as pertaining to papermaking using additives. It would have been obvious to one of ordinary skill in the art to obtain the claimed surfactant/polymer ratio in the process of Ryles et al in view of Honig et al and further in view of Haylock as a functionally equivalent option. Making a paper sheet at the claimed speed using a high speed papermaking process would also have been obvious. Obtaining the claimed improvement in properties of a paper would be obvious since the composition used to make the paper is the same as the claimed composition.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure [Iovine et al (4305860), Lin et al(5374336), Tadokoro et al (EP-1247898 A1)]. The first two references pertain to other polymer systems similar to the claimed invention that are used in papermaking. The last two references pertain to monomeric additives similar to those used to form the polymer of the instant invention or to other polymers that give the claimed property improvements in paper.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis Cordray whose telephone number is 571-272-8244. The examiner can normally be reached on M - F, 7:30 -4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DRC

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